

REMARKS

Claims 1-36 are canceled. Claim 42 is currently amended. Applicant contends that the amendments contained herein are supported by the Specification as filed and thus do not constitute new matter.

Claim Rejections Under 35 U.S.C. § 102

Claims 37-50 were rejected under 35 U.S.C. § 102(e) as being anticipated by Rathore et al. (U. S. Patent 6,258,710 B1). Applicant respectfully notes that the Examiner objected to claim 42 in paragraph 26 of the Office Action and indicated that claim 42 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Therefore, Applicant respectfully submits that the Examiner inadvertently included claim 42 in the above rejection. Applicant will thus treat the above rejection as being applied to claims 37-41 and 43-50. Applicant respectfully traverses this rejection.

Claim 37 includes in part forming a nitrided metal layer on a diffusion barrier layer, where the nitrided metal layer comprises a first metal component, a second metal component capable of forming a crystalline compound with the first metal component, and nitrogen, where the second metal component has a surface energy lower than a surface energy of the first metal component, and where the nitrided metal layer is rich in the first metal component.

Applicant carefully reviewed Rathore et al. and found no indication of forming a nitrided metal layer on a diffusion barrier layer, where the nitrided metal layer has a first metal component, a second metal component capable of forming a crystalline compound with the first metal component, and nitrogen, where the second metal component has a surface energy lower than a surface energy of the first metal component, and where the nitrided metal layer is rich in the first metal component, as in claim 37.

Rathore et al. (column 8, lines 1-38) includes a layer 5 of an adhesive and contact metal, preferably titanium, tantalum, tantalum nitride, tantalum, chromium, tungsten, or any combination of these layers. An optional thermal diffusion barrier layer 6 of material such as chromium--chromium oxide, tungsten-silicon, tungsten-nitride, tungsten-nitride-silicon, titanium-nitride, tantalum or tantalum-nitride is disposed on layer 5. Neither of

layers 5 or 6 is a nitrided layer having a first metal component, a second metal component capable of forming a crystalline compound with the first metal component, and nitrogen, as in claim 37. Rathore et al. further includes a layer 7 of an element that is capable of forming an intermetallic compound with copper that is disposed on layer 6, as shown in Figure 6. Such element may be selected from the group consisting of hafnium, lanthanum, zirconium, tin and titanium. Layer 7 is not a nitrided metal layer that has a first metal component, a second metal component capable of forming a crystalline compound with the first metal component, and nitrogen, where the second metal component has a surface energy lower than a surface energy of the first metal component, and where the nitrided metal layer is rich in the first metal component, as in claim 37. A thin copper seed layer 8 is formed on layer 7, as shown in Figure 7. Layer 8 is not a nitrided metal layer, as in claim 37. Therefore, Rathore et al. does not include each and every element of claim 37, and claim 37 should be allowed.

Claims 38-41 and 43-50 depend directly or indirectly from claim 37 and thus include patentable limitations of claim 37. Therefore claims 38-41 and 43-50 should be allowed.

Claim Rejections Under 35 U.S.C. § 103

Claims 41 and 43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rathore et al. Applicant respectfully traverses this rejection.

Claim 37 is patentably distinct from Rathore et al. and is nonobvious. Claims 41 and 43 depend directly from claim 37 and thus include patentable limitations of claim 37. Therefore claims 41 and 43 should be allowed.

Claim Rejections Under 35 U.S.C. § 112

Claim 37 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the examiner states that "capable" is a mental step, and it was not clear as to Applicant's process steps that a crystalline compound was actually formed.

The portion of claim 37 that reads "capable of forming a crystalline compound with the first metal component" serves to further describe the second metal component

and is not a process step of claim 37. Therefore, Applicant respectfully submits that claim 37 is not indefinite and should be allowed.

Allowable Subject Matter

Claim 42 was objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for this indication. Claim 42 is rewritten to include all of the limitations of the base claim (claim 37) and any intervening claims (claim 41) and thus should be allowed.

Election/Restrictions

The present application was subjected to a Restriction Requirement by Examiner William D. Coleman in the Office Action mailed on October 28, 2003. Applicant elected, **with traverse**, species XII (first occurrence), drawn to claims 37-50 in the response filed on November 26, 2003. The Office Action of October 28, 2003 noted that species XII is generic. Applicant presumes this statement refers to the first occurrence of species XII, i.e., claims 37-50, as Applicant believes claim 37 to be generic to one or more of claims 51-90 and claims 145-154. Should a generic claim be allowed, Applicant is entitled to consideration of claims to the other species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141.

CONCLUSION

In view of the above remarks, Applicant respectfully submits that the claims are in condition for allowance and requests reconsideration of the application and allowance of the claims.

The Examiner is invited to contact Applicants' representatives at direct dial (612) 312-2200 if there are any questions regarding this Response or if prosecution of the present application may be assisted thereby. No new matter has been added and no additional fee is required by this response.

Respectfully submitted,

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